



RAW SEQUENCE LISTING ERROR REPORT

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: 10/659,948
Source: O/P
Date Processed by STIC: 9/23/2003

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
- 2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, 703-308-4212.

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 4.0 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

<http://www.uspto.gov/web/offices/pac/checker>

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.

Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.

Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<<http://www.uspto.gov/ebc/efs/downloads/documents.htm>> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry directly to:
U.S. Patent and Trademark Office, Technology Center 1600, Reception Area, 7th Floor, Examiner Name, Sequence Information, Crystal Mall One, 1911 South Clark Street, Arlington, VA 22202
Or
U.S. Patent and Trademark Office, Box Sequence, Customer Window, Lobby, Room 1B03, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202
4. Federal Express, United Parcel Service, or other delivery service to: U.S. Patent and Trademark Office, Box Sequence, Room 1B03-Mailroom, Crystal Plaza Two, 2011 South Clark Place, Arlington, VA 22202

Revised 04/24/2003

Raw Sequence Listing Error Summary

ERROR DETECTED

SUGGESTED CORRECTION

SERIAL NUMBER:

10/659,948

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

- 1 _____ Wrapped Nucleics
 Wrapped Aminos The number/text at the end of each line "wrapped" down to the next line. This may occur if your file was retrieved in a word processor after creating it. Please adjust your right margin to .3; this will prevent "wrapping."

- 2 _____ Invalid Line Length The rules require that a line **not exceed** 72 characters in length. This includes white spaces.

- 3 _____ Misaligned Amino
 Numbering The numbering under each 5th amino acid is misaligned. Do **not** use tab codes between numbers; use **space characters**, instead.

- 4 _____ Non-ASCII The submitted file was **not** saved in ASCII(DOS) text, as **required** by the Sequence Rules. Please **ensure your subsequent submission is saved in ASCII text**.

- 5 _____ Variable Length Sequence(s) _____ contain n's or Xaa's representing more than one residue. **Per Sequence Rules, each n or Xaa can only represent a single residue.** Please present the **maximum** number of each residue having variable length and indicate in the <220>-<223> section that some may be missing.

- 6 _____ PatentIn 2.0
 "bug" A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid sequences(s) _____. Normally, PatentIn would automatically generate this section from the previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to the subsequent amino acid sequence. **This applies to the mandatory <220>-<223> sections for Artificial or Unknown sequences.**

- 7 _____ Skipped Sequences
 (OLD RULES) Sequence(s) _____ missing. If intentional, please insert the following lines for **each** skipped sequence:
 (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
 (i) SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading)
 (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
 This sequence is intentionally skipped

 Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to **include** the skipped sequences.

- 8 _____ Skipped Sequences
 (NEW RULES) Sequence(s) _____ missing. If intentional, please insert the following lines for **each** skipped sequence.
 <210> sequence id number
 <400> sequence id number
 000

- 9 _____ Use of n's or Xaa's
 (NEW RULES) Use of n's and/or Xaa's have been detected in the Sequence Listing.
 Per 1.823 of Sequence Rules, use of <220>-<223> is **MANDATORY** if n's or Xaa's are present.
 In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

- 10 _____ Invalid <213>
 Response Per 1.823 of Sequence Rules, the only **valid** <213> responses are: Unknown, Artificial Sequence, or scientific name (Genus/species). <220>-<223> section is **required** when <213> response is Unknown or is Artificial Sequence

- 11 _____ Use of <220> Sequence(s) _____ missing the <220> "Feature" and associated numeric identifiers and responses. Use of <220> to <223> is **MANDATORY** if <213> "Organism" response is "Artificial Sequence" or "Unknown." Please explain source of genetic material in <220> to <223> section.
 (See "Federal Register," 07/01/1998, Vol. 63, No. 104, pp. 29631-32) (Sec. 1.823 of Sequence Rules)

- 12 _____ PatentIn 2.0
 "bug" Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file, resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.

- 13 _____ Misuse of n/Xaa "n" can **only** represent a single nucleotide; "Xaa" can **only** represent a single amino acid



OIEP

RAW SEQUENCE LISTING

DATE: 09/23/2003

PATENT APPLICATION: US/10/659,948

TIME: 18:14:47

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Output Set: N:\CRF4\09232003\J659948.raw

3 <110> APPLICANT: Hovanec, Timothy A
 5 <120> TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
 7 <130> FILE REFERENCE: 81289-294309
 C--> 9 <140> CURRENT APPLICATION NUMBER: US/10/659,948
 C--> 9 <141> CURRENT FILING DATE: 2003-09-10
 9 <150> PRIOR APPLICATION NUMBER: US 09/573,684
 10 <151> PRIOR FILING DATE: 2000-05-19
 12 <150> PRIOR APPLICATION NUMBER: US 60/386,217
 13 <151> PRIOR FILING DATE: 2002-09-19
 15 <150> PRIOR APPLICATION NUMBER: US 60/386,218
 16 <151> PRIOR FILING DATE: 2002-09-19
 18 <150> PRIOR APPLICATION NUMBER: US 60/386,219
 19 <151> PRIOR FILING DATE: 2002-09-19
 21 <160> NUMBER OF SEQ ID NOS: 23
 23 <170> SOFTWARE: PatentIn version 3.2
 25 <210> SEQ ID NO: 1
 26 <211> LENGTH: 1457
 27 <212> TYPE: DNA
 28 <213> ORGANISM: AOB Type A R7clone140 16S rDNA (SEQ ID NO:1)
 30 <400> SEQUENCE: 1
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 35 acgcatcgaa agatgtgcta ataccgcata tactctaagg aggaaagcag gggatcgaaa 180
 37 gaccttgccg ttttgagcgc gccgatgtct gattagctag ttgggtgggt aaaggcctac 240
 39 caaggcgacg atcagtagtt ggtctgagag gacgaccagc cacactggga ctgagacacg 300
 41 gccagactc ctacgggagg cagcagtggg gaattttgga caatgggcgc aagcctgac 360
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 45 aaaggttacg gtaaataatc gtgactcatg acggtatcga cagaagaagc accggctaac 480
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 49 aaagggtgcg caggcggtt tgtaagtcag atgtgaaatc cccgggctta acctgggaat 600
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 53 tgaaatgcgt agagatatgg aagaacatcg atggcgaagg cagcctcctg ggtaaacact 720
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 67 cttgtcatta attgccatca tttggttggg cactttaatg agactgccgg tgacaaaccg 1140
 69 gaggaaggtg gggatgacgt caagtcctca tggcccttat gggtagggct tcacacgtaa 1200
 71 tacaatggcg cgtacagagg gttgccaacc cgcgaggggg agctaattctc agaaagcgcg 1260
 73 tcgtagtccg gatcggagtc tgcaactcga ctccgtgaag tcggaatcgc tagtaatcgc 1320
 75 ggatcagcat gtcgcggtga atacgttccc gggctctgta cacaccgccc gtcacaccat 1380

Does Not Comply
Corrected Diskette Needed

pp 1-5

not necessary

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Input Set : A:\81289-294309.ST25.txt

Output Set: N:\CRF4\09232003\J659948.raw

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79 gattcatgac tggggtg 1457
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83 <211> LENGTH: 1457
84 <212> TYPE: DNA
85 <213> ORGANISM: AOB Type A1 R7clone187 16S rDNA (SEQ ID NO:2)
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92 acgcatcgaa agatgtgcta ataccgcata tactctaagg aggaaagcag gggatcgaaa 180
94 gaccttgccg ttttgagcg gccgatgtct gattagctag ttggtgggt aaagcctac 240
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98 gccagactc ctacgggagg cagcagtggg gaattttgga caatgggagc aagcctgac 360
100 cagcaatgcc gcgtgagtga agaaggcctt cgggttgtaa agctctttca gtcgagaaga 420
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110 tgaaatgcgt agagatatgg aagaacatcg atggcgaagg cagcctcctg ggtaaacact 720
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118 gcacaagcgg tggattatgt ggattaattc gatgcaacgc gaaaaacctt acctaccctt 960
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122 catggctgtc gtcagctcgt gtcgtgagat gttgggttaa gtcccgaac gagcgcaacc 1080
124 cttgtcatta attgccatca tttggttggg cactttaatg agactgccgg tgacaaaccg 1140
126 gaggaagggt gggatgacgt caagtcctca tggcccttat gggtagggct tcacacgtaa 1200
128 tacaatggcg cgtacagagg gttgcccaacc cgcgaggggg agctaattctc agaaagcgcg 1260
130 tcgtagtccg gatcgagtc tgcaactcga ctccgtgaag tcggaatcgc tagtaatcgc 1320
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151 ccttgccgctc ttggagcggc cgtgtctga ttagctagtt ggtgaggtaa tggcttacca 240
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155 ccagactcct acgggaggca gcagtgggga attttggaac atgggggaaa ccctgatcca 360
157 gccatgccgc gtgagtgaag aaggccttcg ggttgtaaag ctctttcagc cggaacgaaa 420
159 cggtcacggc taataccgt gactactgac ggtaccggaa gaagaagcac cggctaacta 480
161 cgtgccagca gccgcggtaa tacgtagggt gcaagcgtta atcggaatta ctgggcgtaa 540
163 agcgtgcgca ggcggttttg taagtcagat gtgaaagccc cgggcttaac ctgggaactg 600
165 cgtttgaaac tacaaggcta gagtgtggca gaggggggtg gaattccacg tgtagcagtg 660
167 aaatgcgtag agatgtggag gaacaccgat ggcgaaggca gcccctggg ttaacaccga 720

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Input Set : A:\81289-294309.ST25.txt

Output Set: N:\CRF4\09232003\J659948.raw

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173 ttggccgcct ggggagtagc gtcgcaagat taaaactcaa aggaattgac ggggacccgc 900
175 acaagcgggtg gattatgtgg attaatcga tgcaacgcga aaaaccttac ctacccttga 960
177 catgtaccga agcccgcgga gaggtgggtg tgcccgaag ggagcggtaa cacaggtgct 1020
179 gcatggctgt cgtcagctcg tgtcgtgaga tgttgggtta agtcccgcaa cgagcgcaac 1080
181 ccttgtcatt aattgccatc attcagttgg gcactttaat gaaactgccg gtgacaaacc 1140
183 ggaggaaggt ggggatgacg tcaagtctc atggccctta tgggtagggc ttcacacgta 1200
185 atacaatggc gcgtacagag ggttgccaac ccgcgagggg gagctaattc cagaaagcgc 1260
187 gtcgtagtcc ggatcggagt ctgcaactcg actccgtgaa gtcggaatcg ctagtaatcg 1320
189 cggatcagca tgtcgcggtg aatacgttcc cgggtcttgt acacaccgcc cgtcacacca 1380
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197 <211> LENGTH: 1460

198 <212> TYPE: DNA

199 <213> ORGANISM: AOB Type C R5clone47 16S rDNA (SEQ ID NO:4)

201 <400> SEQUENCE: 4

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206 gcatcgaaag atgtgctaata accgcatatc tctgaggaga aaagcagggg atcgcaagac 180
208 cttgcgctaa aggagcggcc gatgtctgat tagctagttg gtggggtaaa ggcttaccaa 240
210 ggcaacgata agtagttggt ctgagaggac gaccaaccac actgggactg agacacggcc 300
212 cagactccta cgggaggcag cagtggggaa ttttggacaa tgggcgaaag cctgatccag 360
214 ccatgccgcg tgagtgaaga aggccttcgg gttgtagagc tcttttagtc agaaagaaag 420
216 aatcatgatg aataattatg atttatgacg gtagcgtaac aaaaagcacc ggctaactac 480
218 gtgccagcag ccgcggtaat acgtagggtg cgagcggttaa tcggaattac tgggcgtaaa 540
220 ggggtgcgag gcggttttgt aagtcagatg tgaaagcccc gggcttaacc tgggaattgc 600
222 gtttgaaact acaaggctag agtcgacgag aggggagtggt aattccatgt gtagcagtga 660
224 aatgcgtaga gatgtggaag aacaccgatg gcgaaggcag ctccctgggt tgacactgac 720
226 gctcatgcac gaaagcgtgg ggagcaaca ggattagata ccctggtagt ccacgcccta 780
228 aacgatgtca actggttgct ggatctaatt aaggatttgg taacgtagct aacgcgtgaa 840
230 gttgaccgcc tggggagtac ggtcgcaaga taaaactca aaggaattga cggggacccg 900
232 cacaagcggg ggattatgtg gattaattcg atgcaacgcg aaaaacctta cctacccttg 960
234 acatgcttgg aatctagtgg agacataaga gtgcccgaag gggagccaag acacaggtgc 1020
236 tgcattgctg tcgtcagctc gtgtcgtgag atgttgggtt aagtcgccga acgagcgcaa 1080
238 cccttgtcac taattgctat cattctaaat gagcacttta gtgagactgc cggtgacaaa 1140
240 ccggaggaag gtggggatga cgtcaagtcc tcatggccct tatgggtagg gcttcacacg 1200
242 taatacaatg gcgtgtacag agggttgcca accgcgagg gggagccaat ctcaaaaagc 1260
244 acgtcgtagt ccggatcga gtctgcaact cgactccgtg aagtcggaat cgctagtaat 1320
246 cgcggatcag catgccgcgg tgaatacgtt ccgggtctt gtacacaccg cccgtcacac 1380
248 catgggagtg gttttcacca gaagcaggta gtttaaccgt aaggaggacg cttgccacgg 1440
250 tgggggtcat gactgggggtg 1460

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253 <210> SEQ ID NO: 5

254 <211> LENGTH: 18

255 <212> TYPE: DNA

256 <213> ORGANISM: Originucleotide Probe (SEQ ID NO:5)

258 <400> SEQUENCE: 5

259 cccccctctt ctggatac

18

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/659,948

DATE: 09/23/2003

TIME: 18:14:47

Input Set : A:\81289-294309.ST25.txt

Output Set: N:\CRF4\09232003\J659948.raw

262 <210> SEQ ID NO: 6
 263 <211> LENGTH: 18
 264 <212> TYPE: DNA
 265 <213> ORGANISM: PCR primer (SEQ ID NO:6)
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 268 cggaacgtat ccagaaga 18
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 272 <211> LENGTH: 18
 273 <212> TYPE: DNA
 274 <213> ORGANISM: PCR primer (SEQ ID NO:7)
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 280 <210> SEQ ID NO: 8
 281 <211> LENGTH: 19
 282 <212> TYPE: DNA
 283 <213> ORGANISM: Oligonucleotide probe (SEQ ID NO:8)
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 289 <210> SEQ ID NO: 9
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 291 <212> TYPE: DNA
 292 <213> ORGANISM: PCR primer (SEQ ID NO:9)
 294 <400> SEQUENCE: 9
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 298 <210> SEQ ID NO: 10
 299 <211> LENGTH: 16
 300 <212> TYPE: DNA
 301 <213> ORGANISM: PCR primer (SEQ ID NO:10)
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 307 <210> SEQ ID NO: 11
 308 <211> LENGTH: 19
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 310 <213> ORGANISM: PCR primer (SEQ ID NO:11)
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 317 <211> LENGTH: 19
 318 <212> TYPE: DNA
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 321 <400> SEQUENCE: 12
 322 gtctccayta gattccaag 19
 325 <210> SEQ ID NO: 13
 326 <211> LENGTH: 17
 327 <212> TYPE: DNA
 328 <213> ORGANISM: PCR primer (SEQ ID NO:13)
 330 <400> SEQUENCE: 13
 331 gtttgatcct ggctcag 17
 334 <210> SEQ ID NO: 14

RAW SEQUENCE LISTING

DATE: 09/23/2003

PATENT APPLICATION: US/10/659,948

TIME: 18:14:47

Input Set : A:\81289-294309.ST25.txt

Output Set: N:\CRF4\09232003\J659948.raw

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 336 <212> TYPE: DNA
 337 <213> ORGANISM: PCR primer (SEQ ID NO:14)
 339 <400> SEQUENCE: 14
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 343 <210> SEQ ID NO: 15
 344 <211> LENGTH: 17
 345 <212> TYPE: DNA
 346 <213> ORGANISM: PCR primer (SEQ ID NO:15)
 348 <400> SEQUENCE: 15
 349 cctacgggag gcagcag 17
 352 <210> SEQ ID NO: 16
 353 <211> LENGTH: 18
 354 <212> TYPE: DNA
 355 <213> ORGANISM: PCR primer (SEQ ID NO:16)
 357 <400> SEQUENCE: 16
 358 gwattaccgc ggckgctg 18
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 364 <213> ORGANISM: PCR primer (SEQ ID NO:17)
 366 <400> SEQUENCE: 17
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 370 <210> SEQ ID NO: 18
 371 <211> LENGTH: 1467
 372 <212> TYPE: DNA
 373 <213> ORGANISM: N. Aestuarii-like AOB P4clone42 16S rDNA (SEQ ID NO:18)
 375 <400> SEQUENCE: 18
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 386 tgggactgag acacggccca gactcctacg ggaggcagca gtggggaatt ttggacaatg 360
 388 ggcgaaagcc tgatccagca atgccgcgtg agtgaagaag gcttcgggtt gtaaagctct 420
 390 ttcagtcgag aagaaaaggt tgtgactaat aatcacaact tatgatggta ccgacagaag 480
 392 aagcaccggc taactacgtg ccagcagccg cggtaatagc taggggtgaa gcgttaatcg 540
 394 gaattactgg gcgtaaaggg tgcgcaggcg gctttgtaag tcagatgtga aatccccggg 600
 396 cttaacctgg gaattgcgtt tgaaactaca aagctagagt gtagcagagg ggggtggaat 660
 398 tccatgtgta gcagtgaat gcgtagagat atggaagaac atcgatggcg aaggcagccc 720
 400 cctgggttaa catgacgct catgcacgaa agcgtgggga gcaaacagga ttagataccc 780
 402 tggtagtcca cgccctaaac gatgtcaact agttgttggg ccttactagg cttggtaacg 840
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 412 gcaacgagcg caacccttgt cattaattgc catcatttag ttgggcactt taatgagact 1140
 414 gccggtgaca aaccggagga aggtggggat gacgtcaagt cctcatggcc cttatgggta 1200
 416 gggcttcaca cgtaatacaa tggcgcgtac agagggttgc caaccgcga gggggagcta 1260

Please
 correct this
 type of error in
 subsequent sequences

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/659,948

DATE: 09/23/2003

TIME: 18:14:48

Input Set : A:\81289-294309.ST25.txt

Output Set: N:\CRF4\09232003\J659948.raw

L:9 M:270 C: Current Application Number differs, Replaced Current Application No

L:9 M:271 C: Current Filing Date differs, Replaced Current Filing Date